

REMARKS

Upon entry of this amendment, claims 1-24 are pending in the application. Claims 1, 4, 10, 15, 17 and 23 have been amended. No new subject matter has been added.

I. Objections to the Specification

The Examiner had raised clarity objections to the specification. In particular, the Examiner had indicated that a brief description of Figure 7a and 7b is required in the specification.

Applicant has amended the specification to include descriptions for Figure 7a and 7b in the “Brief Description of Drawings” section of the specification. Support for these amendments can be found at least at page 18, line 31 to page 19, line 7 and page 20, line 28 to page 21, line 6.

The Examiner has also requested a new listing of claims to clarify that claim 24 has been amended. Applicants have provided a new listing of claims indicating that claim 24 has previously been previously amended.

The Examiner further objected that the current claims contain two each of the end of claim 22, claim 23, and claim 24.

Applicant included a new listing of claims with this response that replaces all previous listings; the current listing contains only one copy of claim 22, claim 23, and claim 24.

II. Claim Rejections – 35 USC § 112

The Examiner has rejected claims 4, 10, 15 and 17 under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 has been amended to add a period “.” to the end of claim 4. Claims 10, 15, and 17 have been amended to replace the term “or” with “and” as indicated in the enclosed amended claim set.

In view of the claim amendments, Applicant therefore respectfully requests the withdrawal of the rejection of claims 4, 10, 15 and 17 under 35 U.S.C. 112, second paragraph.

III. Double Patenting

The Examiner has rejected claims 1-7, 10, 12, 21, 22 and 24 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 12-15, 17, 26-29, 32, 34-37, 40 and 41 of U.S. Patent No. 6,946,112 (where the National University of Singapore is also the applicant).

In order to advance prosecution, Applicant hereby submits a terminal disclaimer over U.S. Patent No. 6,946,112. Applicant therefore respectfully requests the withdrawal of the rejection of claims 1-7, 10, 12, 21, 22 and 24 on the ground of nonstatutory obviousness-type double patenting.

IV. Claim Rejections – 35 USC § 102

Chen et al. (US 2003/0129126 A1)

The Examiner has rejected present claims 1-7, 10, 12, 21, 22 and 24 under U.S.C. 102(e) as being anticipated by US 2003/0129126 A1 (where National University of Singapore is the applicant).

Enclosed are the executed declarations under 37 C.F.R. § 1.132 by Drs. Chen and Xiong for submission with the USPTO. Applicant respectfully submits that the declarations establish, in accordance with MPEP 716.10, that the relevant portions of Chen et al. originated solely with the inventors of the present application, Drs. Chen and Xiong. Therefore, the Chen et al. reference is not a valid reference under 35 U.S.C. 102(e).

Meisner et al. (6,967,012)

The Examiner has rejected claims 1-24 of the present application under U.S.C. 102(e) as allegedly being anticipated by Meisner et al. (6,967,012). The Examiner stated that Meisner et al discloses imides that can include a mixture of metal cations selected from Li, Mg, Al, Ca and Na, and the metal cations are disclosed with sufficient specificity such that one skilled in the art would select the combinations recited in the instant claims and would understand that atomic balancing must be performed to arrive at the compounds of the present claims. The Examiner further asserts that these prior compositions would inherently be capable of desorbing more than 80% of absorbed hydrogen because they are the same as disclosed in the present application.

Present claim 1 has been amended to more explicitly define that dissimilar metal atoms are selected to enable the compound to reversibly absorb hydrogen at an absorption temperature and pressure, and to desorb 60% or more by weight of said absorbed hydrogen at a desorption temperature and pressure. Accordingly, it is respectfully submitted that the presently claimed invention is a selection invention in that the dissimilar metal atoms are specifically chosen such that the resulting compound can achieve the advantageous property of desorbing 60% or more by weight of said absorbed hydrogen.

Nowhere in Meisner et al teaches that a multi-metal-nitrogen compound comprising at least two dissimilar metal atoms and a nitrogen atom, wherein the dissimilar metal atoms are selected to enable the compound obtained to reversibly desorb 60% or more by weight of the absorbed hydrogen at a desorption temperature and pressure, as required by present claim 1.

Meisner et al provides only cursory mention that the cations of the metal-nitrogen compounds can be a mixture selected from Li, Mg, Al, Ca and Na. However, there is no disclosure that any of the compounds disclosed in Meisner et al is capable of reversibly desorbing 60% or more by weight of the absorbed hydrogen. The only mention of hydrogen desorption amount in Meisner et al is on col 7, line 37 to line 49, which discloses that 4.0 wt % and 6.52 wt % of hydrogen is desorbed by the compounds it teaches. The values of 4.0 wt % and 6.52 wt % are based

on the weight of the compounds and not the amount of absorbed hydrogen, which is required by claim 1. Accordingly, the disclosures made in Meisner et al cannot be regarded as anticipatory of present claim 1. Since nowhere in Meisner et al mentions or teaches about compounds being capable of reversibly desorbing at least 60% by weight of the absorbed hydrogen, Meisner et al cannot overcome the novelty of claim 1.

Even with the correct combination of the cations, a person skilled in the art would not be able to achieve the advantageous desorption properties as recited in present claim 1 without knowledge of the exact stoichiometric ratios of the atoms within the compounds. Accordingly, since Meisner et al does not disclose or show a particular combination of the cations with a particular stoichiometric ratio which is capable of achieving a hydrogen desorption amount of 60% or more by weight of the absorbed hydrogen, Meisner et al is not novelty destroying.

Further, the Examiner's opinion that given the correct combination of the cations, atomic balancing can be performed by the skilled artisan to achieve the same compound of the present claims is not fully substantiated. In the field of chemistry, it is understood that the mere fact that two compounds containing the same elements and each having proper atomic balancing, does not necessarily mean that the two compounds are the same compounds or share the same properties.

A simple analogy to illustrate this is the comparison between the compounds of water (H_2O) and hydrogen peroxide (H_2O_2). Both these compounds contain hydrogen (H) and oxygen (O) elements and both have proper atomic balancing. Nevertheless, water (H_2O) and hydrogen peroxide (H_2O_2) are vastly different compounds with entirely different properties. Hence, without any substantial evidence, the Examiner's mere assertion that atomic balancing can be performed by the skilled artisan in light of Meisner et al to achieve the same compound of the present claims, cannot be taken to be novelty destroying.

Accordingly, based on the above, it would be also impermissible to assert that the prior compounds disclosed in Meisner et al would inherently be capable of desorbing more than 80% of

absorbed hydrogen because they are the same as disclosed in the present specification, when in fact the exact same compounds are not disclosed in the prior art document.

Pinkerton et al. (2005/0191236 A1).

The Examiner has rejected claims 6, 7, 10, 11, 19 and 20 as allegedly being anticipated under U.S.C. 102(e) by Pinkerton et al. (2005/0191236 A1).

Again, Pinkerton et al like Meisner et al is silent of any compound that is capable of achieving a hydrogen desorption amount of 60% or more by weight of the absorbed hydrogen. Paragraphs [0039] to [0042] of Pinkerton et al disclose that the hydrogen desorption ranges from 3.8 wt % to 9.6 wt % of the starting materials. There is no disclosure of hydrogen desorption amount of 60% or more by weight of the absorbed hydrogen as required in presently amended claim 1.

Similarly, based on at least the same arguments provided above, Pinkerton et al is not an anticipatory piece of art.

Moreover, it is respectfully submitted that unlike presently amended claim 1, the materials taught in Pinkerton et al are not reversible hydrogen storage materials, i.e., the materials can only desorb hydrogen but cannot re-absorb hydrogen, which is clearly different from presently amended claim 1. Presently amended claim 1 recites that the compound can reversibly absorb hydrogen and desorb hydrogen and thus differs entirely from Pinkerton et al.

For the reasons stated above, Applicant respectfully requests that the Examiner withdraw the rejections of the pending claims under 35 U.S.C. 102.

V. Obviousness of the Present Claims

While the Examiner did not present any rejections based on obviousness under 35 U.S.C. 103, Applicant wishes to preemptively address the issue.

Since none of the prior art documents disclose or suggest reversible hydrogen storage compounds that can achieve a hydrogen desorption amount of 60% or more by weight of the absorbed hydrogen, a person skilled in the art would have no reason to be able to arrive at the compounds taught in the present claims.

Furthermore, as discussed above, it would not have been obvious to arrive at the present invention even if the specific combination of cations is provided because there exists a plethora of different combinations of stoichiometric ratios of the individual elements which would in turn lead to a myriad of possible compounds. None of the prior art documents provide any indication on the properties of all of these possible compounds and whether any of such compounds can achieve a hydrogen desorption amount of 60% or more by weight of the absorbed hydrogen. Therefore, it is respectfully submitted that the present claims are novel and non-obvious over the cited prior art documents.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing **Docket No. 28450200800**. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

By: /Brian B. Ho/

Brian B. Ho

Registration No.: 60,199

MORRISON & FOERSTER LLP

425 Market Street

San Francisco, California 94105-2482

Telephone: 415.268.7624

Fax: 415.268.7522